What is claimed is:

1. An air dehydration membrane comprising a hydrophilic polymer having a permeability for water vapor which is greater than its permeability for air, said hydrophilic polymer also showing low selectivity between oxygen and nitrogen, the polymer having a hydrophilic coating, wherein the coating is chosen such that the coating does not affect the selectivity of the coated membrane with respect to oxygen and nitrogen, but does increase selectivity of the membrane with respect to water vapor.

2. The membrane of Claim 1, wherein the hydrophilic polymer is selected from the group consisting of polysulfone and poly ether sulfone.

3. The membrane of Claim 1, wherein the coating is selected from the group consisting of poly vinyl alcohol and Triton X-100.

4. The membrane of Claim 2, wherein the coating is selected from the group consisting of poly vinyl alcohol and Triton X-100.

5. The membrane of Claim 4, wherein the membrane has the form of a hollow fiber.

6. The membrane of Claim 5, wherein the fiber has a bore side and a shell side, and wherein the coating is formed on the bore side.

7. A method of making an air dehydration membrane, comprising:

a) forming a polysulfone polymer into a hollow fiber, the fiber having a bore side and a shell side,

b) coating the bore side of the fiber with a solution selected from the group consisting of poly vinyl alcohol and Triton X-100, and

c) drying the coated fiber.

8. The method of Claim 7, wherein step (a) includes combining the polymer with a solvent and a non-solvent to form a spin dope, and extruding the spin dope to form the hollow fiber.

9. The method of Claim 8, wherein the solvent is selected to be n-methyl-pyrrolidinone, and wherein the non-solvent is selected to be tri-ethylene glycol.

10. The method of Claim 8, wherein the solvent and non-solvent are selected to be present in a ratio of about 2.0 to about 4.0 of solvent to non-solvent.

11. The method of Claim 8, wherein the polymer is present in a concentration of about 40% to about 65% by weight.

12. The method of Claim 8, wherein step (a) includes the step of removing solvent and non-solvent from the fiber.

13. The method of Claim 7, wherein step (b) includes selecting a concentration of the solution of poly vinyl alcohol to be about 4%.

14. The method of Claim 7, wherein step (c) includes air drying and heat treating the coated fiber.

15. A method of making an air dehydration membrane, comprising:

a) forming a poly ether sulfone polymer into a hollow fiber, the fiber having a bore side and a shell side,

b) coating the bore side of the fiber with a solution of poly vinyl alcohol, and

c) drying the coated fiber.

16. The method of Claim 15, wherein step (b) is preceded by the step of flushing the fiber with water and drying the fiber.

17. The method of Claim 16, wherein step (c) includes air drying and heat treating the coated fiber.

18. The use of polysulfone as a primary constituent of a membrane which is coated with a hydrophilic material and used in a process of air dehydration.

19. The use of poly ether sulfone as a primary constituent of a

membrane which is coated with a hydrophilic material and used in a process of air dehydration.